I CLAIM:

1. A detection device for differentiating between a material containing less than a selected amount of lignin and a material containing more than the selected amount of lignin, comprising

a light source comprising an ultraviolet component positioned to emit light to strike the material,

a detector for detecting ultraviolet light and generating an electrical signal proportional to an intensity of detected ultraviolet light, the detector being positioned to detect ultraviolet light diffusely reflected off of the material,

an optical filter disposed between the material and the detector to eliminate components of diffusely reflected light outside of the ultraviolet range,

and

an instrument for measuring a level of the electrical signal,

wherein the level of the electrical signal can be compared to a reference level to determine whether the material contains less than or more than the selected amount of lignin.

2. The device as defined in claim 1 in which the material is a paper product.

3. The device as defined in claim 2 in which the instrument for measuring the level of the electrical signal comprises a computer.

4. The device as defined in claim 3 in which the computer is programmed to compare the level of the electrical signal to a predetermined reference level and to

output a logic high signal or a logic low signal to indicate that the paper product contains more or less than the selected amount of lignin.

5.   The device as defined in claim 4 in which at least one of the logic high signal or the logic low signal activates a separating mechanism.

6.   The device as defined in claim 1 in which the light source also emits light components outside of the ultraviolet range.

7.   The device as defined in claim 2 in which the selected amount of lignin is determined by a threshold relative reflectance defined by the equation

$$[\% R]_{TS} = [\%R]_{high} \text{ groundwood} + ([\% R]_{low} \text{ white} - [\% R]_{high} \text{ groundwood})/2$$

where $[\% R]_{TS}$ is the threshold relative reflectance, $[\% R]_{high}$ groundwood is an upper limit of groundwood relative reflectance range, and $[\% R]_{low}$ white is a lower limit of white relative reflectance range.

8.   A method of differentiating between a material containing less than a selected amount of lignin and a material containing more than the selected amount of lignin, comprising the steps of:

a)   emitting light comprising an ultraviolet component to strike the material,

b)   detecting an ultraviolet component of the light diffusely reflected off of the material,

c)   generating an electrical signal proportional to an intensity of detected ultraviolet light,

d)   measuring a level of the electrical signal, and

e)   comparing the level of the electrical signal to a reference level to determine whether the material contains less than or more than the selected amount of lignin.

9.   The method as defined in claim 8 in which the material is a paper product.

10.   The method as defined in claim 9 in which the level of the electrical signal is measured by a computer.

11.   The method as defined in claim 10 in which the computer compares the level of the electrical signal to a predetermined reference level and outputs a logic high signal or a logic low signal to indicate that the paper product contains more or less than the selected amount of lignin.

12.   The method as defined in claim 11 in which at least one of the logic high signal or the logic low signal activates a separating mechanism.

13.   The method as defined in claim 8 wherein the emitted light includes components outside of the ultraviolet range.

14.   The method as defined in claim 9 in which the selected amount of lignin is determined by a threshold relative reflectance defined by the equation

$$[\% R]_{TS} = [\%R]_{high} \text{ groundwood} + ([\% R]_{low} \text{ white} - [\% R]_{high} \text{ groundwood})/2$$

where $[\% R]_{TS}$ is the threshold relative reflectance, $[\% R]_{high}$ groundwood is an upper limit of groundwood relative reflectance range, and $[\% R]_{low}$ white is a lower limit of white relative reflectance range.

15.   An apparatus for separating a material containing less than a selected amount of lignin from a material containing more than the selected amount of lignin, comprising
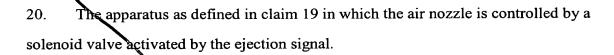
a conveyor for conveying the material to a collection bin,

a detection device disposed adjacent to the conveyor, comprising a light source positioned to emit light comprising an ultraviolet component to strike the material, a detector for detecting ultraviolet light and generating an electrical signal proportional to an intensity of detected ultraviolet light, the detector being positioned to detect ultraviolet light diffusely reflected off of the material, an optical filter disposed between the material and the detector to eliminate components of diffusely reflected light outside of the ultraviolet range, and an instrument for measuring a level of the electrical signal,

a comparing device for comparing the level of the electrical signal to a reference level to determine whether the material contains less than or more than the selected amount of lignin, and

an ejection device disposed downstream of the detection device, for receiving an ejection signal from the comparing device when the material contains more than or less than the selected amount of lignin and ejecting the material in response.

16. The apparatus as defined in claim 15 in which the material is a paper product.

17. The apparatus as defined in claim 16 in which the comparing device comprises a computer.

18. The apparatus as defined in claim 16 in which the light source also emits light components outside of the ultraviolet range.

19. The apparatus as defined in claim 16 in which the ejection device comprises an air nozzle receiving air from a compressor.

20.   The apparatus as defined in claim 19 in which the air nozzle is controlled by a solenoid valve activated by the ejection signal.

21.   The apparatus as defined in claim 17 in which the air nozzle is disposed adjacent to a terminal end of the conveyor and diverts the material into a rejection bin.

22.   The apparatus as defined in claim 16 in which the selected amount of lignin is determined by a threshold relative reflectance defined by the equation

$$[\% R]_{TS} = [\%R]_{high}\ groundwood + ([\% R]_{low}\ white - [\% R]_{high}\ groundwood)/2$$

where $[\% R]_{TS}$ is the threshold relative reflectance, $[\% R]_{high}$ groundwood is an upper limit of groundwood relative reflectance range, and $[\% R]_{low}$ white is a lower limit of white relative reflectance range.